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Outcome of Acute Viral Hepatitis in Children admitted in Tertiary Care Hospital of Ahmedabad, Gujarat

Ekta A Dalal[1], Gaurav Vishal[2], Jeegar M shah[3]

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Author's Affiliation:
[1]Associate professor, Dept of Pediatrics, GMERS, Gandhinagar;
[2]Neonatologist; [3]Associate Professor, Dept of Surgery, GMERS, Gandhinagar

Correspondence:
Dr Ekta Dalal
drektadalal@gmail.com

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ABSTRACT

Introduction: Viral hepatitis is a major health problem in both developing countries. Caused mainly by 5 hepatotropic viruses designated as hepatitis A, B, C, D, E. The present study was aimed to study the impact of various epidemiological factors, to compare the etiological profile of common viral agents and to study the outcome of children admitted with acute viral hepatitis.

Methodology: This was a hospital based cross sectional study. All the children admitted in paediatric ward with symptoms of acute viral hepatitis during the study period were enrolled in the study. In this study data collected. Patients were treated according to protocol and final outcome was recorded.

Results: Out of total 150 patients, maximum numbers of patients (45.33%) were less than 5 years of age and 108 (72%) were male. Most common complication was Fulminant Hepatic Failure (20%). Other complications were encephalopathy (5.33%), acute kidney injury (4%), DIC (2.67%) and spontaneous bacterial peritonitis (1.33%). Out of total 150, 142 (94.67%) were discharged suggesting acute viral hepatitis infection has good outcome.

Conclusion: From the present study we concluded that fulminant hepatic failure due to hepatitis A virus is more common at younger age with high mortality. Safe drinking water and food and early active immunization may reduce mortality and improve outcome.

Keywords: Viral Hepatitis, Fulminant Hepatic Failure, outcome.

INTRODUCTION

Viral hepatitis is a major health problem in both developing and developed countries. Caused mainly by 5 hepatotropic viruses designated as hepatitis A, B, C, D, E. Many other viruses (and diseases) can cause hepatitis, usually as one of the component of multisystem disease. These include HSV, CMV, EBV, varicella zoster virus, HIV, adenoviruses, enteroviruses, parvoviruses B19, arboviruses.[1] It has been estimated that around 4 million children in India suffer every year from acute viral hepatitis. Hepatitis A and hepatitis E approx. 70% cases, hepatitis B is around 18% cases.[2]

There is increasing evidence for another Virus not characterized and referred to as non A, B, C, D and E hepatitis virus. Hepatitis G is one candidate and there will be others. All these human hepatitis viruses are RNA viruses except for hepatitis B which is a DNA virus. These agents can be distinguished by their molecular and antigenic properties. Hepatitis A is a self- limited faeco- orally transmitted disease. Hepatitis B is also parentally transmitted but has a high chronicity rate. Hepatitis E is enterically transmitted disease. All types produce clinically similar illness. These range from asymptomatic and in apparent to fulminate and acute fatal infections common to all types, on the one hand, and from subclinical persistent infections to rapidly progressive chronic liver disease with cirrhosis and even hepato cellular carcinoma, common to blood borne types (HBV, HCV and HDV) , on the other.

Most of our knowledge about hepatitis viruses has been gathered in past 15-20 years during a period of pre-occupation with this group of diseases. There is a need for study of these etiological agents in jaundice for prevention of 2 viral hepatitis which in turn is dependent on the social behaviour and hygienic factors in a particular community. As hepatitis B and C lead to hepatocellular carcinoma in the long run, the epidemiological study of these two viral hepatitis is necessary for the prevention of this complication especially with the advent of vaccines.[3] The most common complication of Hepatitis is Fulminant Hepatic Failure. Other complications are encephalopathy, acute kidney injury, DIC, spontaneous bacterial peritonitis etc.

The present study was aimed to study the impact of various epidemiological factors, to compare the etiological profile of common viral agents and to study the outcome of children(<12 years) admitted with acute viral hepatitis in paediatric ward of tertiary care institute of Gujarat. Every year significant no of children admitted with faeco -oral transmission of hepatitis virus in pediatric ward. Higher incidence of acute viral hepatitis may be due to decreased maternal antibody transfer during birth or poor seroprevalence of HAV antibody in the maternal population. This study was designed to find out causative organisms and morbidity and mortality associated with it.

METHODOLOGY

This was a hospital based cross sectional study. All the children admitted in paediatric ward with symptoms of acute viral hepatitis during the study period of October 2011 to September 2013 were enrolled in the study.

All children <12 years admitted in the paediatrics ward with the symptoms (jaundice) or signs (icterus) or biochemical (serum bilirubin, SGPT) results suggestive of acute viral hepatitis were included in the study. Patients having hepatitis due to other etiology then viral infection. Patients having chronic hepatitis, obstructive jaundice, portal hypertension, underlying liver disease, poisoning, toxin or drug induced hepatitis were excluded from the study. Patients <1 month of age, admitted in neonatal ward were also excluded. Before the start of the study informed written consent of parents/Guardian of patients was taken.

Method of collection of data: In this study data collected by complete history and examination and the suspected cases were screened for hepatitis A,B,C and E virus. Liver function test, complete blood count and renal function tests were done in every patient. Patients were treated according to protocol and final outcome was recorded.

The material collected for the viral marker was 5 ml of whole blood collected in sterile test tube without adding any anticoagulant. Each sample was tested by using ELISA kits supplied for Hepatitis B surface antigen (Hep ELISA kit), IgM antibodies to Hepatitis A virus (DSI kit), IgM antibodies to Hepatitis E virus (DSI kit) and Antibody hepatitis C virus epitopes (Polyelisa kit).

Ethical Considerations: Permission of Ethical committee of the institute was taken to conduct the study. Informed written consent of all Parents/Guardian of patients was taken in front of one witness. Parents/Guardian of patients not willing to give informed written consent was excluded from the study without affecting their course of treatment.

Data analysis: Computerised analysis of data was done with the help of Graph pad version 5 demos. The study variables were analysed for their association with immediate outcome by applying chi-square test or Fisher's exact test as and when applicable. All p values were two tailed and $p<0.05$ was considered statistically significant.

RESULT

The present study includes clinical evaluation of paediatric patients hospitalized and diagnosed as acute viral hepatitis during the period of October 2011 to September 2013.

Out of total 10655 total admissions in paediatric ward during the study period, 150 (1.40%) patients were having acute viral hepatitis.

Table 1: Socio-demographic Variables of study participants (N=150)

Variable	Cases (%)
Age (in Years)	
<5	68 (45.33)
5-10	52 (34.67)
>10	30 (20.0)
Gender	
Male	108 (72.0)
Female	42 (28.0)
Residence	
Rural	30 (20.0)
Urban Slum	24 (16.0)
Urban	96 (64.0)
Socio-Economic Status	
Upper	0
Upper Middle	0
Lower Middle	58 (38.67)
Upper Lower	72 (48.0)
Lower	20 (13.33)

Table 1 shows socio-demographic characteristics of study participants. It was seen that maximum number of patients (45.33%) were less than 5 years

of age. Male were more commonly affected. Out of total 150 patients, 108 (72%) were male. Disease were more seen among Upper lower socio economic class

Out of total 150 patients, 88 (58.67%) were having Hepatitis A infection. 36 (24%) patients were having Hepatitis E infection. In Other group, cases included patients mainly with dengue fever with signs of acute hepatitis.

Table 2: Causative agent wise distribution of study participants

Causative Agent	Cases (%)
Hepatitis A	88 (58.67)
Hepatitis E	36 (24.0)
Hepatitis B	5 (3.33)
Hepatitis C	0
Hepatitis A&E	12 (8.0)
Others	9 (6.0)

Table 3: Complication of different types of Hepatitis infection among study participants

Complication	Hepatitis A	Hepatitis E	Hepatitis A&E	Total
Fulminant Hepatic Failure	22 (73.33)	5 (16.67)	3 (10.0)	30 (20.0)
Encephalopathy	6 (75.0)	1 (12.5)	1 (12.5)	8 (5.33)
Acute Kidney Injury	4 (66.67)	2 (33.33)	0	6 (4.0)
Disseminated Intravascular Coagulation	3 (75.0)	1 (25.0)	0	4 (2.67)
Spontaneous Bacterial Peritonitis	1 (50.0)	1 (50.0)	0	2 (1.33)

Table 4: Different Causative agent wise Outcome of study participants

Outcome	Total (%) (n=150)	Hep A (%) (n=88)	Hep E (%) (n=36)	Hep A & E (%) (n=12)	Hep B (%) (n=5)	Others (%) (n=9)
Discharged	142 (94.67)	85 (96.59)	34 (94.44)	9 (75.0)	5 (100)	9 (100)
Expired	8 (5.33)	3 (3.41)	2 (5.55)	3 (25.0)	0	0

It was observed that most common complication was Fulminant Hepatic Failure among study participants (20%). Other complications were encephalopathy (5.3%), acute kidney injury (4%), DIC (2.7%) and spontaneous bacterial peritonitis (1.3%).

Out of total 150 additions, 142 (94.67%) were discharged and 8 (5.33%) expired, thus suggesting acute viral hepatitis infection has good outcome. Mortality rate with hepatitis A was 3.41% and that with hepatitis E was 5.55%, while hepatitis A + E coinfection has higher mortality (25%). None of the patients of hepatitis B or hepatitis due to other viruses expired. On comparing mortality between hepatitis A infection against A+E coinfection we found p value 0.0219 (<0.05) and this is significant, suggesting coinfection with A+E has increased chances of expiry.

In our study, hepatitis A virus was found in 22(73.33%) out of 30 patients of fulminant hepatic failure while coinfection of hepatitis A and E was found in 3 (6, 67%) patients.

DISCUSSION

In the present study total 150 children of acute viral hepatitis were included. It was seen that maximum number of patients (45.33%) were less than 5 years of age. Similar results were seen in study by Panda et al[6] where Hepatitis A largely affected (59.5%) children < 5 years. Poddar et al[4] and Singh et al[5] also posted similar results.

Male were more commonly affected. Out of total 150 patients, 108 (72%) were male. Poddar et al[4a]lso reported similar result by quoting male 69.77%.[4]

Maximum number of patients belonged to urban slum area (64%) followed by rural area (20%), and both hepatitis A and hepatitis E were the major agents this may be due to the overcrowding and poor food and water hygiene practices by communities residing in this areas and it goes along with the feco oral transmission of these two agents.

On comparison of various studies done on causative organism of viral hepatitis, our study has hepatitis virus is responsible for 58.68% cases which is similar to results noted by Podder et al[4] and panda et al[6,] 64.5%and 55.8% respectively.

Table 5: Comparison of different studies in terms of Fulminant Hepatic Failure patients

Study	HAV	HEV	HBV	HAV+HEV	Others
Present study	73.33%	20%	-	6.67%	-
Poddar et al[4]	53.97%	26.98%	7.94%	11.11%	-
Bendre et al[10]	33.33%	11.11%	8.33%	11.11%	-
Arora et al[11]	40%	35%	12.5%	22.5%	12.5%
Chaddha et al[12]	71.4%	17.9%	10.7%	-	-
Shrivastava et al[13]	2.4%	2.4%	26.95	-	65.9%

Panda et al[6]and Tandon et al[9] did not include hepatitis E in their study and described incidence of non A & non B in their study 23.2% and 24% respectively which is comparable with our study i.e. 24%.

The mean age of child affected with acute viral hepatitis getting complicated with fulminant hepatic failure in present study was 6.1 years, which is similar to study by Poddar et al[4]5.8 years.

Out of total 150 additions, 142 (94.67%) were discharged and 8 (5.33%) expired, thus suggesting acute viral hepatitis infection has good outcome. Singh et al[5] and Poddar et al[4] also reported similar result of 8.5% and 8.72% of mortality.

Higher percentage of fulminant hepatic failure was seen with hepatitis A(73.33%), that was similar to Chaddha et al[12] , while study conducted by Poddar et al[4] ,Bender et al[10] had incidence lower than the present study. The higher percentage of hepatitis A causing fulminant hepatic failure may be due to more number of children affected with hepatitis A in this study and younger age group affected by hepatitis A.

In this study we documented that hepatitis A was the main causative agent responsible for the acute viral hepatitis with higher incidence of complications, 75% of cases of fulminant hepatic failure due to hepatitis A. From the present study we observe that the hepatitis A and hepatitis E coinfection patients with complication has guarded prognosis compared to hepatitis A or hepatitis E infection singly, thus indicating coinfection a poor prognostic indicator in complicated cases.

CONCLUSION

From the present study we concluded that hepatitis A virus is commonest causative agent of acute viral hepatitis with good prognosis. However younger age group (<5 yrs) and coinfection with hepatitis E virus have poor prognosis. Timely done serological viral markers supported with liver function test were good enough to diagnose and prognosticate the admitted cases. Early active immunization of children can be write step towards better future against hepatitis.

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